

10/505474

DT09 Rec'd PCT/PTO 24 AUG 2004

SEQUENCE LISTING

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<120> Cellulolytic enzyme and use thereof

<130> PH-1724-PCT

<160> 52

<170> PatentIn Ver. 3.1

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<213> Coriolus hirsutus

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<223> Inventor: Akira, Tsukamoto ; Seiji, Nakagame ; Mari, Kabuto ;
Jun Sugiura ; Hisako Sakaguchi ; Atsushi Furujo

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Val Leu Pro Gln Ala Ala Ser Ser Ser Glu Phe Ile Gly Glu Ile Val
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Ala Pro Asn Asp Ala Gln Trp Ile Gly Leu Ala Leu Gly Gly Ala Met
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Ile Gly Asp Leu Leu Leu Val Ala Trp Pro Tyr Glu Asn Lys Ile Ile
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Phe Ser Pro Arg Tyr Ala Thr Gly Tyr Thr Leu Pro Ala Val Tyr Glu
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Gly Pro Thr Ile Thr Thr Leu Pro Ser Ser Ser Ile Asn Ser Thr His
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Ser Ile Asp Pro Ser Gly Thr Gly Val Phe Ala Trp Ala Tyr Ser Asn
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Thr Asp Phe Gly Phe Phe Gly Val Asn Phe Pro Asp Ala Gln Asn Ser
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Asn Tyr Gln Ser Tyr Leu Gln Gly Asn Ala Gly Thr Pro Pro Pro Thr
195 200 205

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Ala Thr Ala Thr Pro Phe Asp Tyr Ile Val Val Gly Ala Gly Pro Gly
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Asp Val Pro Trp Ala Lys Ser Ala Asn Leu Thr Lys Phe Asp Val Pro
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Gln Arg Tyr Leu Glu Gln Ser Ala Asn Val Val Gln Gln Leu Leu Gln

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Ser Gln Gly Tyr Arg Gln Val Thr Ile Asn Asp Asp Pro Asp Ser Lys

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Asp His Val Phe Gly Tyr Ser Ala Phe Asp Phe Leu Asn Gly Gln Arg

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Ala Gly Pro Val Ala Thr Tyr Phe Gln Thr Ala Leu Ala Arg Lys Asn

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Asn Gly Ile Gln Ser Arg Gly Arg Ile Gly Val Asp Ala Ala Leu Asn
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<213> *Coriolus hirsutus*

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35 40 45

Val Leu Pro Gln Ala Ala Ser Ser Ser Glu Phe Ile Gly Glu Ile Val

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Ala Pro Asn Asp Ala Gln Trp Ile Gly Leu Ala Leu Gly Gly Ala Met

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Ile Gly Asp Leu Leu Leu Val Ala Trp Pro Tyr Glu Asn Lys Ile Ile
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Phe Ser Pro Arg Tyr Ala Thr Gly Tyr Thr Leu Pro Ala Val Tyr Asp
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Gly Pro Thr Ile Thr Thr Leu Pro Ser Ser Ser Val Asn Ser Thr His
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Trp Lys Phe Val Phe Arg Cys Gln Asn Cys Thr Ser Trp Asp Gly Gly
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Ser Ile Asp Pro Ser Gly Thr Gly Val Phe Ala Trp Ala Tyr Ser Asn
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Val Ala Val Asp Thr Pro Ala Asp Pro Asn Ser Ser Phe Ala Glu His
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Thr Asp Phe Gly Phe Phe Gly Val Asn Phe Pro Asp Ala Gln Asn Ser
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Asn Tyr Gln Asn Tyr Leu Gln Gly Asn Ala Gly Thr Pro Pro Pro Thr
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Gly Leu Ile Ala Ala Asp Arg Leu Ser Glu Ala Gly Lys Lys Val Leu
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Asp Ala Pro Trp Ala Lys Ser Ala Asn Leu Thr Lys Phe Asp Val Pro
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Gly Leu Phe Glu Thr Leu Phe Thr Asp Thr Asn Pro Phe Trp Trp Cys
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Lys Asp Thr Asn Phe Phe Ala Gly Cys Ile Leu Gly Gly Gly Thr Thr
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Val Asn Gly Ala Leu Tyr Trp Tyr Pro Asn Asn Asn Asp Phe Ser Thr
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Ser Gln Gly Tyr Arg Gln Val Thr Ile Asn Asp Asp Pro Asp Ser Lys

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Ala Gly Pro Val Ala Thr Tyr Phe Gln Thr Ala Leu Ala Arg Lys Asn

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Phe Val Tyr Arg Asp Asn Val Leu Val Thr Gln Val Ile Arg Asn Gly

435 440 445

Ser Thr Ile Thr Gly Val Arg Thr Asn Asp Leu Thr Ile Gly Pro Asp

450 455 460

Gly Ile Val Pro Leu Asn Pro Asn Gly Arg Val Ile Leu Ala Gly Gly

465 470 475 480

Ser Phe Gly Thr Pro Arg Ile Leu Phe Gln Ser Gly Ile Gly Pro Thr

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Asp Met Leu Gln Val Val Gln Gly Asn Ala Gln Ala Ala Ala Asn Leu

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Pro Pro Gln Ser Gln Trp Ile Asp Leu Pro Val Gly Gln Ala Val Ser

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Gln Gln Tyr Leu Gln Ser Arg Ser Gly Val Leu Ala Gly Ala Ser Pro
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Lys Leu Asn Phe Trp Arg Ala Tyr Gly Gly Ser Asp Gly Ile Thr Arg
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Tyr Val Asp Ala Tyr Asp Pro Ala Thr Met Cys Ser Asn His Trp Val
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<210> 8

<211> 456

<212> PRT

<213> *Coriolus hirsutus*

<400> 8

Met Phe Pro Thr Val Ser Leu Leu Ala Phe Ser Leu Leu Ala Thr Val

1 5 10 15

Tyr Gly Gln Gln Val Gly Thr Leu Thr Ala Glu Asn His Pro Arg Leu

20 25 30

Thr Val Gln Gln Cys Thr Ala Lys Asn Asn Cys Gln Thr Gln Gln His

35 40 45

Ser Val Val Leu Asp Ser Asn Trp Arg Trp Leu His Ala Thr Thr Gly

50	55	60
Ser Asn Asn Cys Tyr Thr Gly Asn Thr Trp Asp Ala Leu Leu Cys Pro		
65	70	75 80
Asp Ala Thr Thr Cys Ala Lys Asn Cys Ala Val Asp Gly Ala Asp Tyr		
85	90	95
Ala Gly Thr Tyr Gly Ile Thr Thr Asn Gly Asn Ala Leu Thr Leu Lys		
100	105	110
Phe Val Gln Gln Gly Pro Tyr Ser Lys Asn Ile Gly Ser Arg Val Tyr		
115	120	125
Leu Met Asp Ala Gln Asp Gln Lys Tyr Glu Leu Phe Asn Leu Lys Asn		
130	135	140
Gln Glu Phe Thr Phe Asp Val Asp Met Ser Asn Leu Pro Cys Gly Leu		
145	150	155 160
Asn Gly Ala Leu Tyr Phe Val Glu Met Asp Ala Asp Gly Gly Ala Ser		
165	170	175
Arg Phe Pro Thr Asn Lys Ala Gly Ala Lys Tyr Gly Thr Gly Tyr Cys		
180	185	190
Asp Thr Gln Cys Pro Gln Asp Ile Lys Phe Ile Asn Gly Val Ala Asn		
195	200	205

Leu Glu Gly Trp Ala Gly Ser Pro Ser Asp Pro Asn Ser Gly Thr Gly
210 215 220

Ser Phe Gly Thr Cys Cys Asn Glu Met Asp Val Trp Glu Ala Asn Lys
225 230 235 240

Asn Gly Ala Ala Phe Thr Pro His Val Cys Ser Val Thr Ser Gln Thr
245 250 255

Arg Cys Glu Gly Thr Gln Cys Gly Asp Gly Asp Glu Arg Tyr Asp Gly
260 265 270

Leu Cys Asp Lys Asp Gly Cys Asp Phe Asn Ser Phe Arg Xaa Gly Asp
275 280 285

Gln Thr Phe Leu Gly Pro Gly Lys Thr Val Asp Thr Asn Ala Lys Phe
290 295 300

Thr Val Val Thr Gln Phe Leu Thr Asn Asn Asn Gln Thr Ser Gly Gln
305 310 315 320

Leu Ser Glu Ile Arg Arg Leu Tyr Val Gln Asn Gly Arg Val Ile Ala
325 330 335

Asn Ser Lys Thr Asn Val Pro Gly Leu Gly Ala Phe Asp Ser Ile Thr
340 345 350

Asp Gln Phe Cys Asn Ala Gln Lys Gln Val Phe Gly Asp Asp Asn Thr
355 360 365

Phe Glu Lys Leu Gly Gly Leu Asn Thr Met Gly Gln Ala Phe Gln Arg
 370 375 380

Gly Met Ala Leu Val Met Ser Ile Trp Asp Asp His Ala Ala Gly Met
 385 390 395 400

Leu Trp Leu Asp Ala Asp Tyr Pro Pro Thr Arg Pro Arg Pro Thr Pro
 405 410 415

Val Val Ser Arg Gly Pro Cys Ser Ala Thr Ser Gly Asp Pro Ala Thr
 420 425 430

Ile Glu Asn Ser Glu Ala Ser Ser Ser Val Thr Phe Ser Asn Ile Lys
 435 440 445

Val Gly Pro Ile Gly Ser Thr Phe
 450 455

<210> 9

<211> 1488

<212> DNA

<213> *Coriolus hirsutus*

<400> 9

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tcgaccagcg gcagcaacaa ctgctacacc ggcaacacct gggacagctc cctctgcccc 240
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 actcgtcctt tgggtctgac gggcgagcgt gctaaccata tttgatgcgt taggcaccta 360
 cggcatcacc acgagcggta accagctcag tctcaagttc gtaacgcacg gccagtactc 420
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 ccctgcgcgc ggacctccgg cgagccgaag gacgtcgagt ccaacagccc cgacgcgacc 1440
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<210> 10

<211> 456

<212> PRT

<213> *Coriolus hirsutus*

<400> 10

Met Phe Pro Ala Val Ala Leu Leu Ala Leu Ser Phe Phe Ala Ile Ala

1 5 10 15

Tyr Gly Gln Gln Val Gly Thr Leu Thr Ala Glu Asn His Pro Lys Ile

20 25 30

Thr Val Gln Gln Cys Thr Gly Lys Asn Ser Cys Gln Thr Leu Gln Arg

35 40 45

Ser Val Val Leu Asp Ser Asn Trp Arg Trp Leu His Ser Thr Ser Gly

50 55 60

Ser Asn Asn Cys Tyr Thr Gly Asn Thr Trp Asp Ser Ser Leu Cys Pro

65 70 75 80

Asp Pro Thr Thr Cys Ala Lys Asn Cys Ala Leu Asp Gly Ala Asp Tyr

85 90 95

Ala Gly Thr Tyr Gly Ile Thr Thr Ser Gly Asn Gln Leu Ser Leu Lys

100 105 110

Phe Val Thr His Gly Gln Tyr Ser Thr Asn Ile Gly Ser Arg Val Tyr

115 120 125

Leu Leu Asp Gly Ser Asp Ser Lys Tyr Gln Gln Phe Asn Leu Lys Asn

130 135 140

Gln Glu Phe Thr Phe Asp Ile Asp Met Ser Lys Leu Pro Cys Gly Leu

145 150 155 160

Asn Gly Ala Leu Tyr Phe Val Glu Met Asp Ala Asp Gly Gly Leu Ser

165 170 175

Arg Phe Pro Ser Asn Lys Ala Gly Ala Lys Tyr Gly Thr Gly Tyr Cys

180 185 190

Asp Thr Gln Cys Pro His Asp Ile Lys Phe Ile Asn Gly Glu Ala Asn

195 200 205

Val Leu Gly Trp Thr Pro Ser Asp Ser Asp Pro Asn Ala Gly Ser Gly

210 215 220

Gln Tyr Gly Thr Cys Cys Asn Glu Met Asp Ile Trp Glu Ala Asn Ser

225 230 235 240

Met Gly Ala Ala Val Thr Pro His Val Cys Ser Val Thr Ser Gln Thr

245 250 255

Arg Cys Ser Gly Thr Asp Cys Gly Asp Gly Asp Asn Arg Tyr Asn Gly

260 265 270

Ile Cys Asp Lys Asp Gly Cys Asp Phe Asn Ser Trp Arg Met Gly Asp

275 280 285

Gln Thr Phe Leu Gly Pro Gly Lys Thr Val Asn Thr Asn Gln Lys Phe

290 295 300

Thr Val Val Thr Gln Phe Leu Thr Asn Asn Asn Gln Thr Ser Gly Thr
305 310 315 320

Leu Ser Glu Ile Arg Arg Leu Tyr Val Gln Asn Gly Lys Val Ile Ala
325 330 335

Asn Ser Lys Thr Lys Ile Pro Gly Met Asp Ala Tyr Asp Ser Ile Thr
340 345 350

Asp Ala Phe Cys Asn Ala Gln Lys Gln Ala Phe Gly Asp Asn Asn Ser
355 360 365

Phe Glu Arg Leu Gly Gly Leu Lys Ala Met Gly Ala Ala Phe Asp Lys
370 375 380

Gly Met Ser Leu Val Met Ser Ile Trp Asp Asp His Glu Ala Lys Met
385 390 395 400

Leu Trp Leu Asp Ser Glu Tyr Pro Leu Asp Lys Asp Ala Ser Thr Pro
405 410 415

Gly Val Ser Arg Gly Pro Cys Ala Arg Thr Ser Gly Glu Pro Lys Asp
420 425 430

Val Glu Ser Asn Ser Pro Asp Ala Thr Val Val Phe Ser Asn Ile Lys
435 440 445

Tyr Gly Pro Ile Gly Ser Thr Tyr
450 455

<210> 11

<211> 1485

<212> DNA

<213> *Coriolus hirsutus*

<400> 11

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ccgggtccaa gtacggtacc ggctactgcg acaccagtg cccgcacgat atcaagttca 660
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<210> 12

<211> 457

<212> PRT

<213> *Coriolus hirsutus*

<400> 12

Met Phe Pro Thr Ala Ala Leu Leu Ser Leu Ser Phe Ala Ala Ile Ala

1 5 10 15

Tyr Gly Gln Gln Val Gly Thr Leu Thr Ala Glu Ser His Pro Lys Leu

20 25 30

Ser Val Gln Gln Cys Thr Ala Gly Gly Ser Cys Gln Thr Leu Gln Arg

35 40 45

Ser Val Val Leu Asp Ser Asn Trp Arg Trp Leu His Ser Thr Ser Gly

50 55 60

Ser Thr Asn Cys Tyr Thr Gly Asn Thr Trp Asp Ala Ser Leu Cys Pro

65 70 75 80

Asp Pro Thr Thr Cys Ala Ala Asn Cys Ala Leu Asp Gly Ala Asp Tyr

85 90 95

Ser Gly Thr Tyr Gly Ile Thr Thr Ser Gly Asn Glu Leu Asn Leu Arg
100 105 110

Phe Val Thr Lys Gly Gln Tyr Ser Thr Asn Ile Gly Ser Arg Val Tyr
115 120 125

Leu Leu Ser Glu Asp Asp Ser Thr Tyr Glu Met Phe Asn Leu Asn Asn
130 135 140

Gln Glu Phe Thr Phe Asp Val Asp Met Ser Asn Leu Pro Cys Gly Leu
145 150 155 160

Asn Gly Ala Leu Tyr Phe Val Glu Met Asp Lys Asp Gly Gly Ser Ser
165 170 175

Arg Phe Pro Thr Asn Lys Ala Gly Ser Lys Tyr Gly Thr Gly Tyr Cys
180 185 190

Asp Thr Gln Cys Pro His Asp Ile Lys Phe Ile Asn Gly Glu Ala Asn
195 200 205

Val Leu Gly Trp Glu Gly Ser Pro Asn Asp Pro Asn Ala Gly Thr Gly
210 215 220

Gln Tyr Gly Thr Cys Cys Asn Glu Met Asp Ile Trp Glu Ala Asn Gln
225 230 235 240

Asn Gly Ala Ala Val Thr Pro His Val Cys Ser Val Asp Gly Gln Thr

	245	250	255
Arg Cys Glu Gly Thr Asp Cys Gly Asp Gly Asp Glu Arg Tyr Asp Gly			
	260	265	270
Ile Cys Asp Lys Asp Gly Cys Asp Phe Asn Ser Tyr Arg Met Gly Asp			
	275	280	285
Gln Ser Phe Leu Gly Leu Gly Lys Thr Val Asp Thr Ser Lys Lys Phe			
	290	295	300
Thr Val Val Thr Gln Phe Leu Thr Ala Asp Asn Thr Thr Thr Gly Gln			
305	310	315	320
Leu Thr Glu Ile Arg Arg Leu Tyr Val Gln Asp Gly Lys Val Ile Ala			
	325	330	335
Asn Ser Lys Thr Asn Ile Pro Gly Leu Asp Ser Phe Asp Ser Ile Thr			
	340	345	350
Asp Asp Phe Cys Asn Ala Gln Lys Glu Val Phe Gly Asp Thr Asn Ser			
	355	360	365
Phe Glu Lys Leu Gly Gly Leu Ala Glu Met Gly Lys Ala Phe Gln Lys			
	370	375	380
Gly Met Val Leu Val Met Ser Ile Trp Asp Asp His Ala Ala Asn Met			
385	390	395	400

Leu Trp Leu Asp Ser Asp Tyr Pro Thr Asp Ala Asp Pro Ser Lys Pro
 405 410 415

Gly Val Ala Arg Gly Pro Cys Pro Thr Ser Ser Gly Val Pro Thr Asp
 420 425 430

Val Glu Ser Gln Ser Pro Asn Ala Asn Val Ile Phe Ser Asn Ile Lys
 435 440 445

Thr Gly Pro Ile Gly Ser Thr Tyr Ala
 450 455

<210> 13

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 13

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21

<210> 14

<211> 1704

<212> DNA

<213> Coriolus hirsutus

<400> 14

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<210> 15

<211> 453

<212> PRT

<213> *Coriolus hirsutus*

<400> 15

Met Ser Lys Phe Ala Thr Leu Leu Ala Leu Leu Thr Val Val Pro Ser

1 5 10 15

Leu Ala Tyr Ala Gln Ala Ser Leu Tyr Gly Gln Cys Gly Gly Ile Gly

20 25 30

Phe Ser Gly Pro Thr Thr Cys Val Ala Gly Ala Val Cys Thr Lys Gln

35 40 45

Asn Asp Tyr Tyr Ser Gln Cys Leu Pro Gly Ala Ala Ala Pro Thr Thr

50 55 60

Val Ala Pro Thr Thr Thr Pro Asn Ala Pro Thr Ser Ala Pro Gly Gly

65 70 75 80

Gly Ser Pro Thr Ser Ser Ala Pro Ser Ala Pro Ser Ser Thr Pro Ala

85 90 95

Ala Gly Asn Pro Phe Asp Gly Phe Glu Ile Tyr Leu Ser Pro Tyr Tyr

100	105	110	
Ala Lys Glu Val Ala Ala Ala Ala Ala Ala Ile Thr Asp Pro Thr Leu			
115	120	125	
Lys Ser Lys Ala Ala Ser Val Ala Asn Ile Pro Thr Phe Thr Trp Leu			
130	135	140	
Asp Ser Val Ser Lys Val Pro Asp Leu Gly Thr Tyr Leu Ala Asp Ala			
145	150	155	160
Ser Ser Ile Gln Ser Ser Thr Gly Lys Lys Gln Leu Val Pro Ile Val			
165	170	175	
Val Tyr Asp Leu Pro Asp Arg Asp Cys Ala Ala Lys Ala Ser Asn Gly			
180	185	190	
Glu Phe Ser Ile Ala Asp Gly Gly Ala Ala Lys Tyr Lys Asp Tyr Ile			
195	200	205	
Asp Gln Ile Val Ala Gln Ile Lys Gln Phe Pro Asp Val Arg Val Val			
210	215	220	
Ala Val Ile Glu Pro Asp Ser Leu Ala Asn Leu Val Thr Asn Leu Asn			
225	230	235	240
Val Gln Lys Cys Ala Asn Ala Glu Ala Thr Tyr Lys Ala Ser Val Thr			
245	250	255	

Tyr Ala Leu Gln Gln Leu Ser Ser Val Gly Val Tyr Gln Tyr Met Asp
260 265 270

Ala Gly His Ala Gly Trp Leu Gly Trp Pro Ala Asn Ile Gln Pro Ala
275 280 285

Ala Thr Leu Phe Ala Glu Met Phe Lys Ser Ala Asn Ser Ser Pro Phe
290 295 300

Val Arg Gly Leu Ala Thr Asn Val Ala Asn Tyr Asn Ala Leu Thr Ala
305 310 315 320

Ala Ser Pro Asp Pro Ile Thr Gln Asn Asn Pro Asn Tyr Asp Glu Ser
325 330 335

His Tyr Ile Asn Ala Leu Gly Pro Met Leu Lys Ser Ala Gly Phe Pro
340 345 350

Ala Gln Phe Val Val Asp Gln Gly Arg Ala Gly Gln Gln Asn Leu Arg
355 360 365

Gln Gln Trp Gly Asp Trp Cys Asn Ile Lys Gly Ala Gly Phe Gly Thr
370 375 380

Arg Pro Thr Thr Asn Thr Gly Asn Pro Leu Ile Asp Ala Ile Ile Trp
385 390 395 400

Val Lys Pro Gly Gly Glu Ser Asp Gly Thr Ser Asn Ser Ser Ser Pro
405 410 415

Arg Tyr Asp Ser Thr Cys Ser Leu Ser Asp Ala Thr Val Pro Ala Pro

420

425

430

Glu Ala Gly Thr Trp Phe Gln Ala Tyr Phe Glu Thr Leu Val Ser Lys

435

440

445

Ala Asn Pro Pro Leu

450

<210> 16

<211> 17

<212> DNA

<213> Artificial

<220>

<223> Synthetic DNA

<400> 16

gtaaaacgac ggccagt

17

<210> 17

<211> 19

<212> DNA

<213> Artificial

<220>

<223> Synthetic DNA

<400> 17

ggaaacagct atgaccatg

19

<210> 18

<211> 1327

<212> cDNA

<213> *Coriolus hirsutus*

<400> 18

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<210> 19

<211> 374

<212> PRT

<213> *Coriolus hirsutus*

<400> 19

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1 5 10 15

Ala Pro Thr Ala Val Asn Ala His Gly Phe Ile His Glu Tyr Glu Ile

20 25 30

Gly Gly Lys Ser Tyr Ser Gly Trp Leu Pro Phe Ser Asp Pro Tyr Glu

35 40 45

Ser Pro Val Pro Ser Arg Ile Glu Arg Lys Ile Pro Ser Asp Gly Pro

50 55 60

Ile Leu Asp Val Thr Ser Pro Asp Leu Ala Cys Asn Lys Gly Gly Glu

65 70 75 80

Ser Gly Val Lys Ala Ile Ala Thr Ala Ala Ala Gly Ser Gln Ile Thr
85 90 95

Phe Asp Trp Asn Ser Trp Pro Ala Asp His Met Gly Pro Val Thr Thr
100 105 110

Tyr Met Ala Ser Cys Asn Gly Asp Cys Ala Ser Phe Asp Ala Ser Asn
115 120 125

Ala Lys Trp Phe Lys Ile Asp Ala Ala Gly Tyr Ser Asn Gly Lys Trp
130 135 140

Ala Ala Thr Lys Leu Ile Glu Asn Gly Ala Lys Trp Thr Ser Thr Ile
145 150 155 160

Pro Ser Glu Leu Lys Ala Gly Glu Tyr Leu Val Arg His Glu Ile Ile
165 170 175

Ala Leu His Asp Ala Gly Ala Pro Gln Phe Tyr Pro Ser Cys Ala Gln
180 185 190

Val Lys Val Thr Gly Gly Gly Ser Gln Val Pro Ser Gly Ser Ser Leu
195 200 205

Val Ser Ile Pro Gly Leu Tyr Thr Ile Gln Glu Phe Pro Thr Ser Gly
210 215 220

Pro Thr Ala Ser Arg Ala Leu Pro Phe Leu Asp Pro Arg Ser Pro Ser

225 230 235 240

Val Ala Pro Thr Ala Ala Leu Ala Ile Leu Ser Leu Leu Pro Pro Pro

245 250 255

Leu Pro Thr Pro Leu Leu Leu Arg Arg Pro Pro Ser Leu Arg Pro Arg

260 265 270

Arg Arg Phe Thr Pro Pro Arg Arg Pro Pro Arg Arg Pro Arg Arg Arg

275 280 285

Leu Leu Arg Pro Thr His Leu Pro Leu Pro Thr Leu Pro Arg Pro His

290 295 300

Pro Arg Arg Ser Pro Arg Arg Arg Gly Pro Glu Gly Ala Pro Leu Ser

305 310 315 320

Ala Leu Ala Ala Ala Trp Ser Ser Ala Thr Ser Leu Thr Thr Pro Ser

325 330 335

Ala Thr Thr Ile Asp Phe Ser Phe Phe Leu Ala Leu Leu Ala Val Ser

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Arg Ser Arg Tyr Ala Ser Glu Lys His Trp Ser Thr Gly Ser Gln Ser

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Met Leu Ile Gln Met Gly

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<213> *Coriolus hirsutus*

<400> 20

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<211> 216

<212> PRT

<213> *Coriolus hirsutus*

<400> 21

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Val Ala Trp Lys Thr Thr Trp Gln Trp Thr Gly Gly Ser Gly Val Lys			
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Ser Phe Thr Asn Ile Gln Leu Asn Glu Gly Leu Asn Lys Gln Leu Ser			
50	55	60	
Ala Ile Lys Ser Ile Pro Thr Thr Trp Gln Trp Ser Gln Ser Ala Ser			
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Gly Ser Ile Val Ala Asp Val Ala Tyr Asp Leu Phe Thr Ala Asn Thr			
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Ala Gly Gly Ser Asn Val Asn Glu Ile Met Ile Trp Leu Ala Asn Phe			
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Asn Ala Gly Pro Ile Ser Phe Gln Tyr Gly Ala Asp Gly Lys Pro Val			
115	120	125	
Pro Val Ala Ser Asn Leu Ser Leu Ala Gly His Thr Trp Asn Leu Tyr			
130	135	140	
Ser Gly Ser Asn Gly Ala Asn Ala Val Phe Ser Phe Leu Pro Thr Ser			
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Gly Thr Ile Thr Ser Phe Ser Gly Asp Val Asn Val Phe Leu Gln Tyr			
165	170	175	
Leu Thr Gln His Gln Gly Val Ser Thr Ser Gln Phe Leu Val Thr Ala			
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Gln Ala Gly Thr Glu Pro Thr Ser Gly Ser Ala Thr Leu Thr Thr Ser			
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21

<210> 24

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<213> Phanerochaete chrysosporium

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<212> PRT

<213> *Phanerochaete chrysosporium*

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Ala Thr Thr Cys Val Ala Gly Ser Val Cys Ser Val Leu Asn Pro Tyr
 35 40 45

Tyr Ser Gln Cys Ile Pro Gly Ala Ala Thr Val Thr Ser Ser Ser Ala
 50 55 60

Pro Ser Thr Pro Thr Pro Pro Ala Gly Ala Leu Pro Arg Leu Gly Gly
 65 70 75 80

Val Asn Thr Ala Gly Tyr Asp Phe Ser Val Ala Thr Asp Gly Ser Phe
85 90 95

Thr Gly Thr Gly Val Ser Pro Pro Val Ser Gln Phe Ser His Phe Ser
100 105 110

Ser Gln Gly Ala Asn Leu Tyr Arg Ile Leu Phe Ala Trp Gln Leu Met
115 120 125

Thr Pro Thr Leu Gly Gly Thr Ile Ser Gln Ser Phe Leu Ser Arg Tyr
130 135 140

Asp Gln Thr Val Gln Ala Ala Leu Asn Ser Gly Pro Asn Val Phe Val
145 150 155 160

Ile Ile Asp Leu His Asn Tyr Ala Arg Trp Asn Gly Gly Ile Ile Ala
165 170 175

Gln Gly Gly Pro Thr Asp Ala Gln Phe Gln Ser Ile Trp Thr Gln Leu
180 185 190

Ala Gln Lys Tyr Gly Ser Asn Gln Arg Val Ile Phe Gly Ile Met Asn
195 200 205

Glu Pro His Asp Ile Pro Ser Ile Ser Thr Trp Val Asn Ser Val Gln
210 215 220

Gly Ala Val Asn Ala Ile Arg Ala Ala Gly Ala Thr Asn Tyr Leu Leu
225 230 235 240

Leu Pro Gly Ser Ser Trp Ser Ser Ala Gln Ala Phe Pro Thr Glu Ala
245 250 255

Gly Pro Leu Leu Val Lys Val Thr Asp Pro Leu Gly Gly Thr Ser Lys
260 265 270

Leu Ile Phe Asp Val His Lys Tyr Leu Asp Ser Asp Asn Ser Gly Thr
275 280 285

His Pro Asp Cys Thr Thr Asp Asn Val Gln Val Leu Gln Thr Leu Val
290 295 300

Gln Phe Leu Gln Ala Asn Gly Asn Arg Gln Ala Ile Leu Ser Glu Thr
305 310 315 320

Gly Gly Gly Asn Thr Ser Ser Cys Glu Ser Leu Leu Ala Asn Glu Leu
325 330 335

Ala Tyr Val Lys Ser Ala Tyr Pro Thr Leu Ala Gly Phe Ser Val Trp
340 345 350

Ala Ala Gly Ala Phe Asp Thr Thr Tyr Val Leu Thr Val Thr Pro Asn
355 360 365

Ala Asp Gly Ser Asp Gln Pro Leu Trp Val Asp Ala Val Lys Pro Asn
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Leu Pro

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<212> DNA

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<223> Synthetic DNA

<400> 27

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<210> 28

<211> 2138

<212> DNA

<213> *Phanerochaete chrysosporium*

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<211> 592

<212> PRT

<213> Phanerochaete chrysosporium

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35 40 45

Asn Pro His Trp Thr Asn Phe Leu Glu Asn Thr Leu Tyr Phe Tyr Glu
50 55 60

Glu Gln Arg Ser Gly Lys Leu Pro Val Thr Asn Arg Val Pro Trp Arg
65 70 75 80

Asn Asp Ser Ala Thr Asp Asp Gly Arg Asp Val Gly Leu Asp Leu Ser
85 90 95

Gly Gly Tyr Tyr Asp Ala Gly Asp Tyr Ile Lys Tyr Thr Phe Pro Met
100 105 110

Ser Phe Ser Val Met Ser Ile Cys Trp Gly Ala Leu Asp Tyr Gly Lys
115 120 125

Gly Tyr Asp Leu Ala Asn Gln Thr Ala Tyr Leu Asp Asp Met Leu Arg
130 135 140

Trp Ser Leu Asp Trp Leu Met Lys Ala His Pro Asp Pro Asn Thr Leu
145 150 155 160

Tyr Val Gln Val Gly Asp Ala Asp Leu Asp Asn Ala Tyr Trp Gly Gly
165 170 175

Asp Arg Gly Ile Pro Thr Pro Arg Thr Ser Tyr Ala Ile Asn Ser Thr
180 185 190

Ser Pro Gly Thr Asp Ala Ala Ala Gln Ala Ala Ala Ala Phe Ala Ala
195 200 205

Cys Ser Ala Leu Tyr Asn Asn Arg Thr Leu Ser Gln Pro Ala Pro Asn
210 215 220

Gly Ile Thr Ser Thr Ser Tyr Ala Ser Thr Leu Leu Gln His Ala Gln
225 230 235 240

Gln Leu Tyr Asn Phe Ala Thr Asn Ser Ser Val Pro Gln Val Thr Tyr
245 250 255

Gln Ala Ser Glu Pro Ser Val Ala Asp Ala Tyr Ala Ser Ser Gly Phe
260 265 270

Gln Asp Glu Leu Ala Ile Ala Ala Leu Phe Ile Ser Leu Ala Gly Asn
275 280 285

Ser Ser Asp Ala Tyr Pro Gln Ala Ser Gln Val Tyr Arg Lys Gln Gly
290 295 300

Leu Ser Lys His Leu Glu Asp Asp Ala Val Phe Asn Trp Asp Glu Lys
305 310 315 320

Ser Pro Gly Val Ala Leu Leu Ala Ala Gln Ile Ala Gln Lys Tyr Pro
325 330 335

Glu Leu Ala Asn Gly Thr Gly Val Asp Trp Lys Ser Asp Leu Asn Asn
340 345 350

Tyr Phe Asp Arg Ile Val Ser Asn Ser Gly Arg Ser Phe Leu Thr Ser

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Pro Ala Leu Asn Ala Ala Met Leu Leu Leu Arg Tyr Ala Asp Ser Gly		
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Leu Ala Ser Ser Ser Glu Lys Gln Ser Ala Tyr Arg Gln Phe Ala Gln		
405	410	415
Ser Gln Ile Asp Tyr Phe Leu Gly Asn Asn Pro Met Thr Val Gln Tyr		
420	425	430
Met Val Gly Val His Pro Asn Ala Pro Ser Asn Pro His Ser Ala Leu		
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Ala Thr Gly Ala Thr Pro Gln Asp Ile Ala Asn Ile Asp Thr Val Pro		
450	455	460
Glu His Glu Ala Tyr Val Leu Tyr Gly Gly Val Val Gly Gly Pro Asn		
465	470	475 480
Asp Asp Asp Leu Phe Trp Asp Leu Arg Ser Asp Trp Val Glu Ser Glu		
485	490	495
Val Gly Leu Asp Tyr Val Ala Pro Val Val Thr Ile Ala Ala Arg Glu		
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Leu Val Ser Gly Ala Gly Asp Pro Trp Tyr Thr Gln Leu Gln Ala Gly
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Ser Tyr Glu Glu Arg Arg Pro Gly Gly Gln Pro Cys Asp Ala Ala Ile
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Ser Ala Gly Cys Arg Gly His Asp Trp Arg Val Gly Lys Ile Val Met
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<210> 32

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